

# **High Level Architecture Prototype Federations**

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**Chief Scientist**

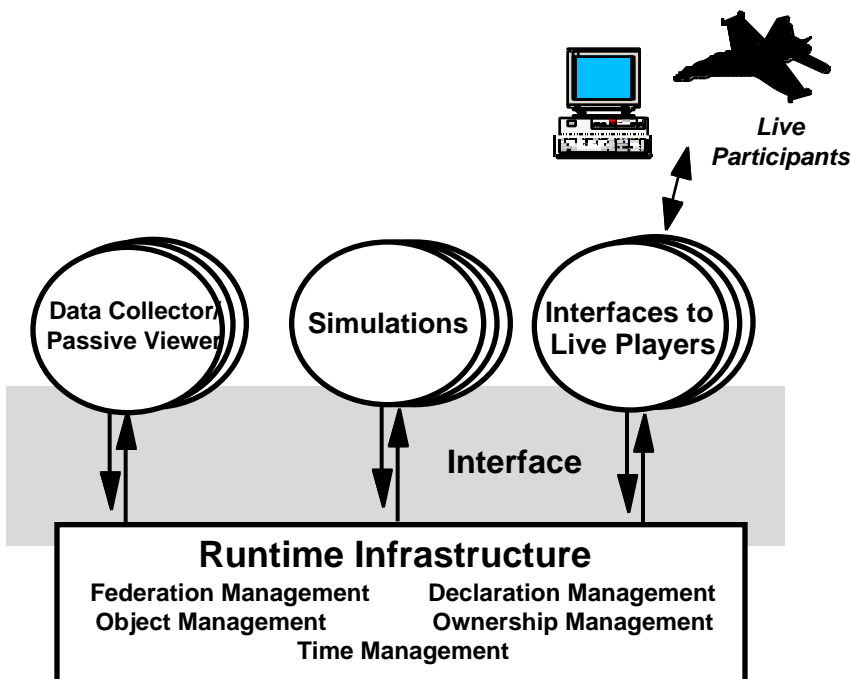
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**11 March 1996**

# High Level Architecture (HLA)



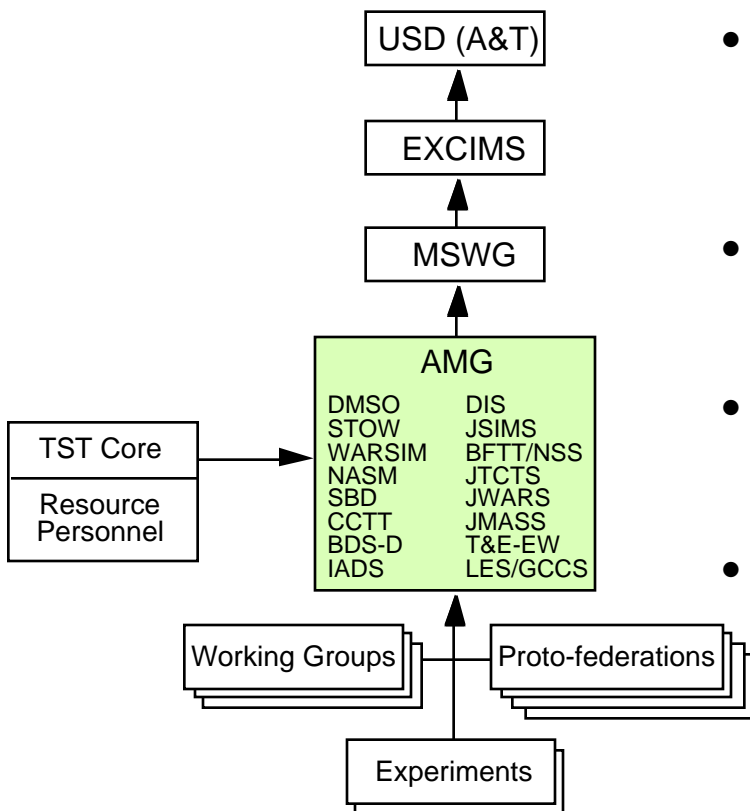
**HLA distributed applications, Federations, include:**

- Federates
- Runtime Infrastructure
- HLA Object Model

**HLA is defined by:**

- Rules (basic principles for federates and federations)
- Interface specification
- Object Model Template specification

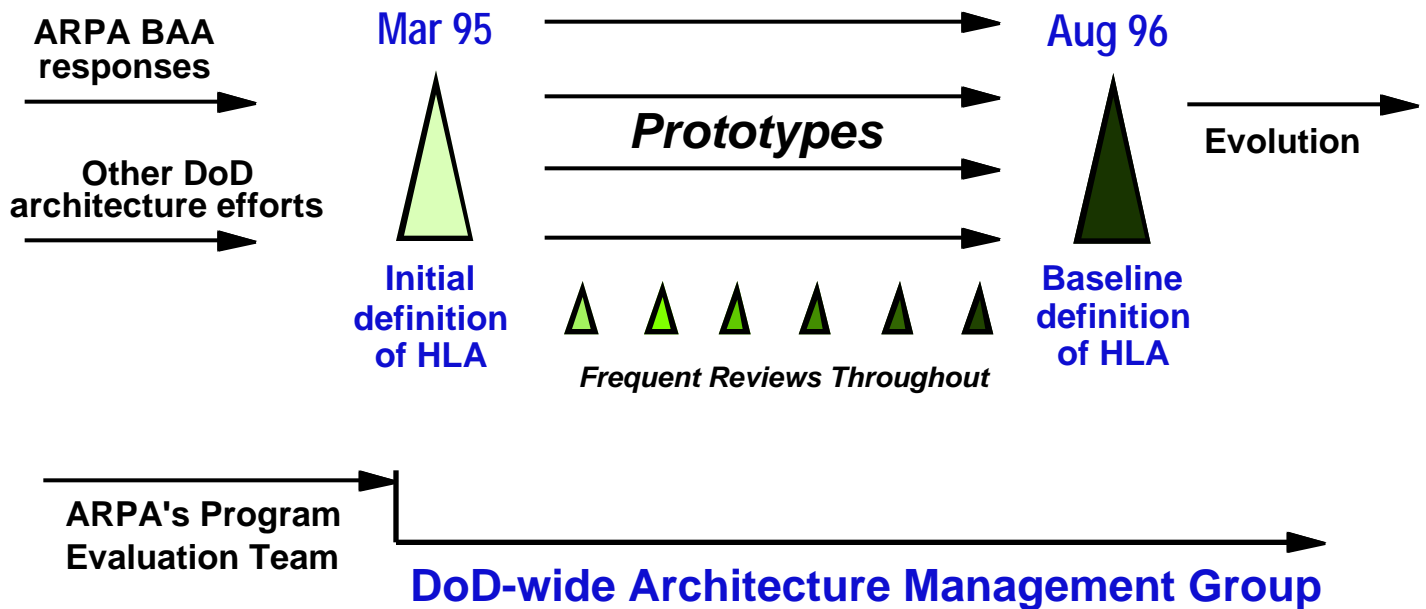
# AMG Structure



- **Representatives of major programs which reflect wide range of simulation applications**
- **Government representatives along with members of industry technical teams**
- **Each program participates in prototyping to address issues of importance to that program**
- **Prototyping supports AMG decisions on HLA Baseline**

# High-Level Architecture Definition Process

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# Key Technical Issue Areas

**Interface Specification** Technical feasibility of single interface for range of simulations and support functions

**Runtime Infrastructure** Technical feasibility, reusability, portability, and variability of RTI

**Simulations** Impact of HLA on simulations

**Object Models** Usability, functionality over life cycle, presentation approaches

**Testing** Test methods for HLA and Federations

**Security** Security Implications of the HLA

**Scope** Breadth of HLA applicability including C4I Interfaces

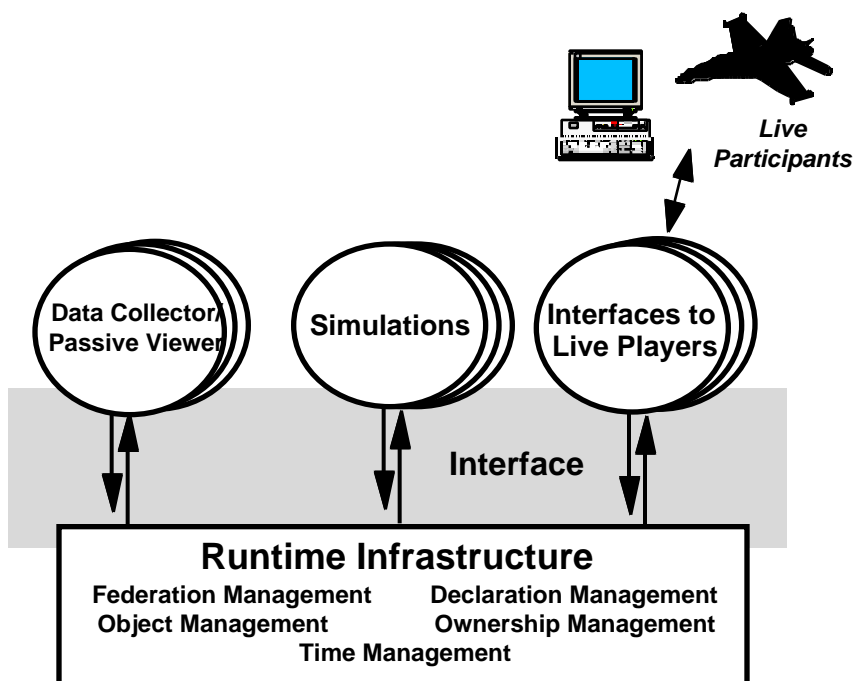
# HLA Prototype Federations

## **Five prototype federations using the HLA**

- Platform Proto-federation (PPF)
- Joint Training Proto-federation (JTFp)
- Analysis Proto-federation
- Engineering Proto-federation
- Joint Precision Strike Demonstration (JPSPD) Experiment

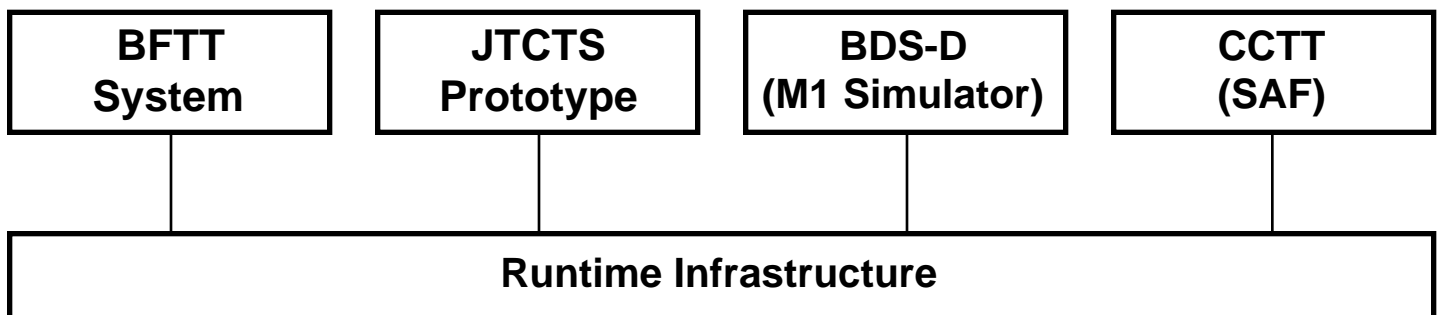
# The Prototype Runtime Infrastructure (RTI)

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- Distributed operating system-like services to support federation runtime operations
- RTI prototype will support multiple proto-federations
- Phased development
- AMG Representative: Duncan Miller, DIS
- Tech Lead: Jim Calvin, MIT/LL

# The Platform Proto-federation

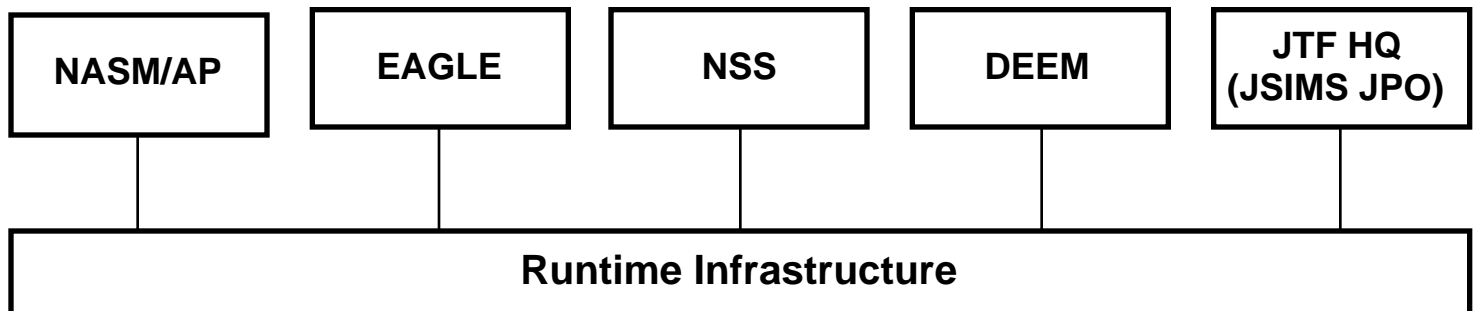


- Platform level real time simulators/simulations
- Currently use DIS 2.X
- Key issues
  - performance
  - transition from DIS to HLA implementation
- Gov't lead: Susan Harkrider, STRICOM
- Tech lead: Steve Bachinsky, TASC



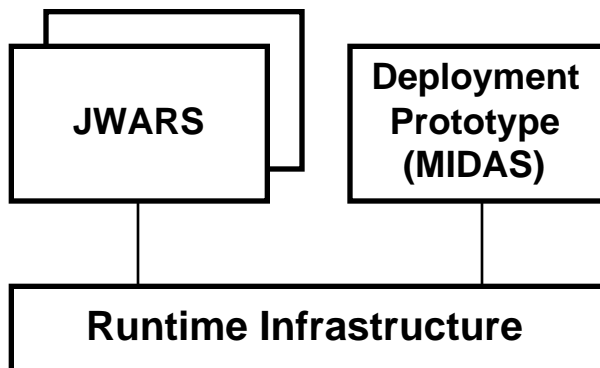
# The Joint Training Proto-federation

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- **Distributed discrete event simulations**
- **Key issues:**
  - Time management
  - Object ownership
  - Environmental representation
- **Gov't Lead: Lt Jim Stein, JSIMS JPO**
- **Tech Lead: Bill Waite, AEgis**

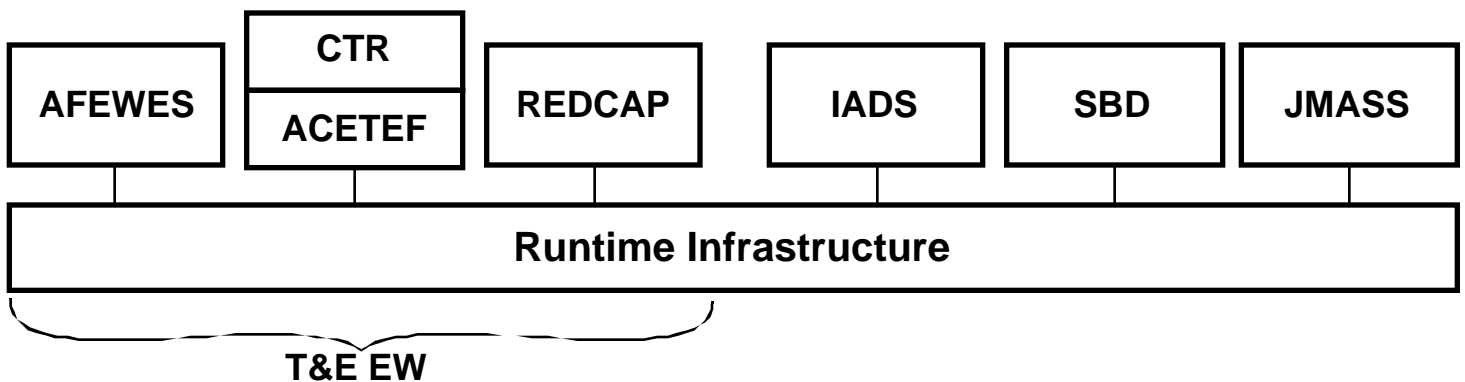
# The Analysis Proto-federation



- **Faster than real time, closed form analysis simulation**
- **Key Issues:**
  - Time management
  - Data filtering
  - Replicability
  - Runtime efficiency
- **Gov't Lead:**  
LTC Terry Prosser,  
JWARS Office
- **Tech Lead:**  
Denis Clements, GRCI

# The Engineering Proto-federation

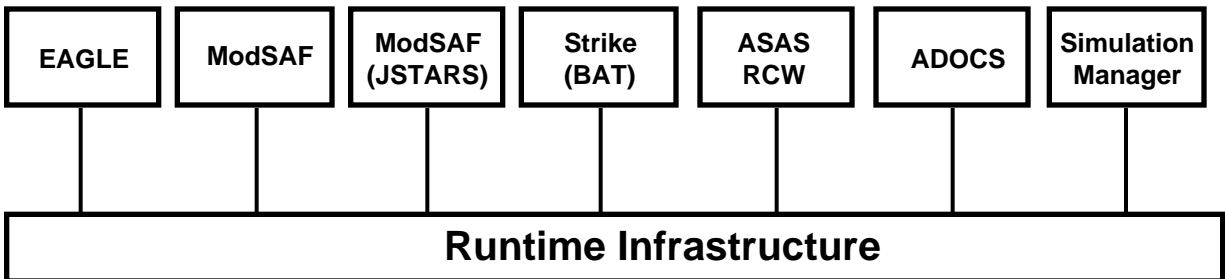
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- **Networked Engineering-level simulation capabilities**
  - Validated detailed, high fidelity simulations
  - DoD 5000 series-compliant acquisition support for T&E and concept evaluation
- **Key Issues:**
  - Object ownership management
  - Performance
- **Gov't Lead: Bob Ruddy, ACETEF**
- **Tech Lead: Dana Paterson, ACETEF**

# The Joint Precision Strike Demonstration (JPSD) HLA Experiment

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- Heterogeneous mix of federates in an existing experimental simulation environment
- Current implementation augments DIS 2.X with tailored HLA-like functionality
- Key issues
  - Can HLA support current functionality? (declaration management, object ownership management, performance)
- Tech lead: Russ Richardson, JPSD

## In Summary...

### Status

- Proto-federations are in testing now
- Federates are being developed/adapted
- RTI version 0.2 delivered and in use
- Federation Object Models have been developed
- Draft test procedures in place for use across prototypes

### Proto-federation experiences support the HLA baseline definition

- HLA Specifications: Feedback in Interface Specification, Object Model Template, and test procedures (through AMG working groups)
- Lessons Learned for Transition: Profiles of federate adaptation to capture implementation experience
- Process of Use: Generating a Federation Development and Execution Process based on composite experience